

1. Personal Details

Name: **Ioannis**
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**Summary of Research Activity**

Publications:	90 papers >100 Conference abstracts 1 International Book 11 Book Chapters
Invited Lectures:	17 in International Conferences 21 in National Conferences
Moderator/Chairman	11 International Congresses
Main Areas of Research:	-MRI and Advanced Imaging techniques -Nuclear Medicine techniques -Radiobiology and Radiotherapy -Oncology
Number of Citations:	970/645
h-index (Google Scholar) / (Scopus):	17/14
i10-index	36

2. Current Position

- 2.1. Associate Professor of Medical Radiation Physics, Medical School, University of Thessaly, Greece.
- 2.2. Visiting Researcher, Department of Neuroimaging, King's College London, UK.

3. Undergraduate Studies

- 3.1. Bachelor of Science in Physics (London Metropolitan University (UNL)), 1998, Distinction: «Upper Second Class Honors».

4. Post Graduate Studies

- 4.1. Master of Science in Medical Physics (M.Sc.) Medical School and Physics Department of the University of Patras and University College Loodon (UCL), 2001
- 4.2. Ph.D. in Medical Physics, University of Thessaly and Karolinska Institutet, Sweden, 2005
- 4.3. Pg Cert in Clinical Education, University of Edinbrugh, Scotland 2018-2019

5. Member of Scientific Societies

- 5.1. European Society for Therapeutic Radiology and Oncology (ESTRO)
- 5.2. Institute of Physics (IoP)
- 5.3. European Society for Magnetic Resonance in Medicine and Biology (ESMRMB)
- 5.4. European Society of Radiology (ESR)

6. Professional licenses

- 6.1. Medical Radiation Physicist for Ionizing radiations (Greek Ministry of Health, 4912 /17.08.2005)
- 6.2. Medical Radiation Physicist for Non-Ionizing radiations (Greek Ministry of Health, 4309 /12.07.2005)

7. Reviewer in International peer-reviewed Journals

Physics in Medicine and Biology,
Radiotherapy and Oncology,
Medical Physics,
JECCR
Journal of Neuroradiology,
Neuroradiology,
Journal of Neuroimaging,
Computer Methods and Programs in Biomedicine,
Medicine

7a. Reviewer in Research programs + External Evaluator/Referee

External examiner for PhD titled: "Multi-parametric MRI of prostate cancer" College of Science, Swansea University Singleton Park, Swansea, SA2 8PP, UK
External examiner for PhD titled: "Quantitative Magnetic Resonance Spectroscopy" College of Science, Swansea University Singleton Park, Swansea, SA2 8PP, UK
Swiss Cancer League, Swiss Cancer Research, Bern, Switzerland
Trans-National Action of Greek Ministry of Education and Religious Affairs
UCL Institute of Nuclear Medicine and the Centre of Medical Imaging : Research Associate : MRI physicist for PET/MR
University of Bristol, Clinical Research and Imaging Centre: Research Associate: quantitative MRI research on hippocampal substructures at 3T clinical MR systems
Imperial College London: Research Associate: Centre of Restorative Neurosciences
University Hospitals Coventry & Warwickshire NHS Trust: Clinical Scientist (MRI)
The Royal Marsden NHS Foundation Trust: Magnetic Resonance (MR) Physicist.
University of Edinburgh : Research Fellow in Magnetic Resonance Imaging
Cardiff University Brain Research Imaging Centre: Research Associate quantitative fMRI

8. Editorial Board Member

Computer Methods and Programs in Biomedicine
International Journal of Radiology

9. Research Programs Evaluator/Reviewer

Swiss Cancer League, Swiss Cancer Research, Bern, Switzerland

Trans-National Action of Greek Ministry of Education and Religious Affairs

10. Awards - Distinctions

- **IAEA Award** - EVT1900768 - RER9147 - Regional Training Course on Radiation Protection in Diagnostic and Therapeutic Nuclear Medicine, Valletta, Malta.
- P044 - Imaging Biomarker Analysis of Structural MR Images for Glioma Grading, ECMP 2nd **Best Poster Award**, ECMP 2018 Copenhagen Denmark
- **Invited Lectures** European Congress of Radiology Vienna **ECR 2015, 2016, 2017** *Diffusion and Perfusion Artifacts in MRI*
- **Brainlab Community Neurosurgery Award**, AANS annual meeting, Washington, DC, USA, May 2015. *Preoperative DTI, Intraoperative Visual Evoked Potentials, and Direct Cortical/Subcortical Stimulation for Visual Pathway Identification*, K. N. Fountas, E. Kapsalaki, **I. Tsougos**, et al
- **Jack Fowler – Young Investigator Award** University of Wisconsin at the 8th ESTRO Congress for the work entitled: *Clinical Evaluation of dose response models and parameter sets predicting radiation induced pneumonitis from breast cancer radiotherapy*, Lisbon, 26-29 09, 2005
- PostDoc Acceptance **Harvard University**, Dana Farber Cancer Institute for the project: Cancer signature trace in the blood of Radiation Therapy patients. 2007
- **EDRO Fellowship**: (50000 Euro for 1 year at **Karolinska Institute, Stockholm University** Sweden for the project entitled: «Prediction of radiation induced pneumonitis after local ± regional radiation therapy for breast cancer patients using radiobiological modeling», 09/2003-10/2004
- **Fellowship** in the Radiation Oncology Department of the **Emory University, Atlanta USA**, in Clinical Radiation Physics (Monte Carlo Dosimetry, Stereotactic Radiotherapy and IMRT techniques in Radiotherapy). (09-12/ 2000).
- Post Doc Fellowship 32.000 Euro, «ΠΥΘΑΓΟΡΑΣ II» Greek Ministry of Education, Patient-specific internal radionuclide dosimetry. (Ε.Π.Ε.Α.Ε.Κ. II.52211.06) 2005-2008
- PhD Fellowship 33.000 Euro, «ΗΡΑΚΛΕΙΤΟΣ» Greek Ministry of Education, Radiation Biology modelling in radiation Pneumonitis in Lung cancer. (Ε.Π.Ε.Α.Ε.Κ. II.52211.06) 2002-2005

11. Clinical and Professional Experience

1. Assistant Professor of Medical Radiation Physics, Medical School, University of Thessaly, Greece. 2013 - 2018.
2. Lecturer of Medical Radiation Physics, Medical School, University of Thessaly, Greece. 2011 - 2013.
3. Medical Radiation Physicist, University Hospital of Larissa, Greece. 2009-2011.
4. Lecturer (Π.Δ. 407/80) Medical Radiation Physics, Medical School, University of Thessaly, Greece 2006-2011.
5. PostDoc Resaeacher, “Πυθαγόρας II” ΓΓΕΤ 2005-2008.

6. Research Fellow, European Society of Therapeutic Radiology and Oncology, EDRO Fellowship: (50.000 Euro) Karolinska Institute, Stockholm University Sweden for the project entitled: «Prediction of radiation induced pneumonitis after local □ regional radiation therapy for breast cancer patients using radiobiological modeling», 09/2003-10/2004
7. Research Fellow in the Radiation Oncology Department of the Emory University, Atlanta USA, in Clinical Radiation Physics (Monte Carlo Dosimetry, Stereotactic Radiotherapy and IMRT techniques in Radiotherapy). (09-12/ 2000).

11. Funded projects as Coordinator and Partner

1. Principal investigator, Research Program for the Greek Ministry of Education, **EΔBM103**, (41.000€) “Multiparametric breast MRI and Artificial intelligence techniques for quantitative imaging biomarkers”
2. Principal investigator, Research Program for the Greek Ministry of Education, "6241" (32.400€) με τίτλο: “Quantification and 'deep learning' classification of imaging biomarkers towards the optimization of MRI differential diagnosis” AP.AIT.35 **ΓΓΕΤ/ΕΛΙΔΕΚ**.
3. Principal Investigator: «*Investigating brain–spine connectivity using functional MRI techniques*” funded by the UK Medical Research Council (**BRC-2412_09**, 16800£), **King’s College London, UK**
4. Principal investigator, Research Program for the Greek Ministry of Education, Magnetic Resonance Spectroscopy (#4021) 2010-2011 Fellowship 33.000 Euros
5. Senior Researcher, Research Program for the Greek Ministry of Education, Advanced Imaging techniques (Ε.Π.Ε.Α.Ε.Κ. ΙΙΙ κωδ.4480.12) 2012-2014 Grant: 150.000 Euros
6. Senior Researcher, Research Program ‘Thalis’ for the Greek Ministry of Education, Multifunctional Polymeric Platform of Magnetic Ferrite Colloidal Nanoparticles for Luminescence, Imaging, and Hyperthermia Applications. (#85406) 2013-2016 Grant 250.000 Euros
7. Senior Researcher, Research Program: ‘PCaGuard’ T1ΕΔΚ-03264 , A decision support system based on advanced clinical theranostics protocols for the cost-effective, personalised management of Prostate Cancer Grant 535.627 Euros

12. Software Development for Clinical use

12.1. **DORES (DOse Response Evaluation Software)**

Tsougos, I., Grout, I., Theodorou, K., Kappas, C. A free software for the evaluation and comparison of dose response models in clinical radiotherapy (DORES) (2009) International Journal of Radiation Biology, 85 (3), pp. 227-237.

DORES is distributed and used under a research license in the following research centers:

1. Dept. Radiation Physics & Radiobiology, **Imperial College Healthcare NHS Trust Charing Cross Hospital London W6 8RF**
2. Department of Radiation Oncology, **VCU**, 401 College St., **Richmond, VA 23298 USA**
3. **GSI Helmholtzzentrum fuer Schwerionenforschung GmbH Planckstrasse Darmstadt**
4. **Hospital Ramón y Cajal, Sº de Oncología Radioterápica Ctra. Colmenar Madrid**
5. Radiation Oncology Dept. **Karmanos Cancer Center, Wayne State University, USA**
6. Regional Medical Physics Department, NCCC block, Freeman Hospital, United Kingdom
7. **Gil-hospital, Incheon, Korea**
8. Departments of Oncology / Radiation Physics **Umeå / Lund University Hospital**
9. Medical School, **University of South Carolina, USA**
10. Medical Physics| **Bupa Cromwell Hospital, Cromwell Road, London, SW5 0TU**

11. Trinity College Dublin
12. Kidwai Memorial Institute of Oncology Hosur Road, Bangalore
13. Radiation Oncology Comlejo Hospitalario Universitario Albacete (CHUA)
14. Department of Oncology Umea Lund Univesrity Hospital
15. Imperial College Charing Cross Hospital (SORA)
16. Military Institute of Science & Technology (MIST) Mirpur Cantonment, Dhaka-1216, Bangladesh.

12.2. **FASMA (FastSpectrscopicMultipleAnalysis)**

Tsolaki E, Svolos P, Kousi E, Kapsalaki E, I. Fezoulidis, K Fountas, Theodorou K, Kappas C, **Tsougos I** Fast Spectroscopic Multiple Analysis (FASMA) for brain tumor classification - A Clinical Decision Support System utilizing multiparametric 3T MR data Int J Comput Assist Radiol Surg. 2015 Jul 3, 10(7): 1149-1166.

12.3. **A Radionuclide Dosimetry Toolkit** on material specific Monte Carlo Kernels.

Loudos, G., **Tsougos, I.**, Boukis, S., Karakatsanis, N., Georgoulas, P., Theodorou, K., Nikita, K., Kappas, C. A radionuclide dosimetry toolkit based on material-specific Monte Carlo dose kernels (2009) Nuclear Medicine Communications, 30 (7), pp. 504-512.

13. Academic and Teaching Experience

Undergraduate Experience

University of Thessaly Medical School: a) Medical Physics 1st Semester, b) Radiation Protection 6th Semester, c) Invited Lecturer in Radiology I and II 6th Semester, d) Invited Lecturer in Nuclear medicine 8th Semester.

Post-graduate Experience

Visiting Professor, MSc King's College London, Center of NeuroImaging, Erasmus+ 2016-2018.

Visiting Professor, MSc Program in Medical Physics, University of Patras, 2006-today.

Professional Experience

Instructor in the Nuclear Medicine Residency Program in Greece - Hellenic Society of Nuclear Medicine & Molecular Imaging.

Instructor in the Medical Physics Residency Program in Greece - Hellenic Society of Medical Physics.

Instructor in the Radiology Residency Program in the University Hospital of Larissa

Instructor in the Neurosurgery Residency Program in the University Hospital of Larissa

MSc and PhD supervising

14 MSc and 10 PhD Theses supervisor or member of the examination committee.

14. Books and Book Chapters

Book: 'Advanced MR Neuroimaging: From Theory to Clinical Practice' Ioannis Tsougos Series: Series in Medical Physics and Biomedical Engineering CRC Press Taylor and Francis ISBN 9781498755238 - CAT# K27451 2017

Book Chapters

- 1 **Internal Radionuclide Dosimetry using quantitative 3-D Nuclear Medical Imaging, Ioannis Tsougos,** George Loudos, Panagiotis Georgoulas Konstantina S. Nikita, Kiki Theodorou "[The Handbook of Research on Advanced Techniques in Diagnostic Imaging and Biomedical Applications](#)" ISBN10: 160566314X

- 2 **Clinical Significance of Tetrofosmin Extracardiac Uptake During Myocardial Perfusion Imaging** Panagiotis Georgoulas, Varvara Valotassiou¹, **Ioannis Tsougos**, George Angelidis and Nikolaos Demakopoulos: [Coronary Angiography - Advances in Noninvasive Imaging Approach for Evaluation of Coronary Artery Disease](#) ISBN 978-953-307-675-1
- 3 **A Statistical Diagnostic Decision Support Tool Using Magnetic Resonance Spectroscopy Data** Evaggelia Tsolaki, Evanthia Kousi, Eftychia Kapsalaki, Ioannis Dimou, Kyriaki Theodorou, Georgios C. Manikis, Constantin Kappas and **Ioannis Tsougos** [Data Mining for Biomarker Discovery Springer Optimization and Its Applications](#) ISBN-10: 1461421063
- 4 **Proton Magnetic Resonance Spectroscopy in Intracranial Gliomas.** E.Z.Kapsalaki, **Ioannis Tsougos**, Kyriaki Theodorou, K.N.Fountas in: [Tumors of the Central Nervous System](#) (Gliomas: Glioblastoma (Part 1)), Volume 1, Part I, pp, 67-79 by M.A. Hayat. Springer, New York 2011, ISBN 978-94-007-0343-8
- 5 **The Role of Magnetic Resonance Spectroscopy in the Diagnosis of Ring Enhancing Lesions,** E Kapsalaki, E D. Gotsis, **I Tsougos**, K N. Fountas in: [Neuroimaging - Clinical Applications](#), pp.145-158, by Peter Bright., InTech Publishers, 2012. ISBN: 978-953-51-0200-7
- 7 **Proton Magnetic Resonance Spectroscopy of the Central Nervous System** E. Kousi, **I Tsougos**, E Kapsalaki, [Novel Frontiers of Advanced Neuroimaging](#)", ISBN 979-953-307-777
- 8 **Diffusion Imaging: Basic Principles I Tsougos** Image Principles, Neck, and the Brain, CRC Press, 2016 ISBN 978-148-221-6134
- 9 **Myocardial Perfusion (SPECT) Imaging: Radiotracers and Techniques** Panagiotis A. Georgoulas, George C. Angelidis, Athanasios S. Zisimopoulos and **Ioannis C. Tsougos** [Frontiers in Heart Failure Bentham eBooks](#), 2016 ISBN 978-1-68108-378-0
- 10 **Artifacts and Pitfalls in Cardiac Molecular Imaging** **Ioannis C. Tsougos** Panagiotis A. Georgoulas [Frontiers in Heart Failure Bentham eBooks](#), 2016 ISBN 978-1-68108-378-0

15. Selected Publications

- [1] **Tsougos, I.**, Mavroidis, P., Rajala, J., Theodorou, K., Järvenpää, R., Pitkänen, M.A., Holli, K., Evaluation of dose-response models and parameters predicting radiation induced pneumonitis using clinical data from breast cancer radiotherapy (2005) *Physics in Medicine and Biology*, 50 (15), pp. 3535-3554.
- [2] **Tsougos, I.**, Mavroidis, P., Theodorou, K., Rajala, J., Pitkänen, M.A., Holli, K., Ojala, A.T., Hyödynmaa, S., Järvenpää, R., Lind, B.K., Kappas, C. Clinical validation of the LKB model and parameter sets for predicting radiation-induced pneumonitis from breast cancer radiotherapy (2006) *Physics in Medicine and Biology*, 51 (3), pp. L1- L9.
- [3] **Tsougos, I.**, Schreibmann, E., Lahanas, M., Theodorou, K., Kappas, C., Baltas, D. Geometrical pre-planning for conformal radiotherapy (2007) *Acta Oncologica* 46 (7) pp 918-927
- [4] **Tsougos, I.**, Nilsson, P., Theodorou, K., Kjellén, E., Ewers, S.-B., Jarlman, O., Lind, B.K., Kappas, C., Mavroidis, P. NTCP modelling and pulmonary function tests evaluation for the prediction of radiation induced pneumonitis in non-small-cell lung cancer radiotherapy (2007) *Physics in Medicine and Biology*, 52 (4), art. no. 013, pp. 1055-1073.
- [5] **Tsougos, I.**, Grout, I., Theodorou, K., Kappas, C. A free software for the evaluation and comparison of dose response models in clinical radiotherapy (DORES) (2009) *International Journal of Radiation Biology*, 85 (3), pp. 227-237.
- [6] **Tsougos I**, Svolos P*, Kousi E, Fountas K, Theodorou K, Fezoulidis I, Kapsalaki E. Differentiation of glioblastoma multiforme from metastatic brain tumor using proton magnetic resonance spectroscopy, diffusion and perfusion metrics at 3 T. (2012) *Cancer Imaging* 12(3): 423-436 (* Joint Authors)
- [7] Tsolaki E, P Svolos, Kousi E, Kapsalaki, E., Fountas, K.N., Theodorou, K., **Tsougos I.** Automated differentiation of glioblastomas from intracranial metastases using 3T MR spectroscopic and perfusion data. *Int J Comput Assist Radiol Surg.* 2013 Sep;8(5):751-61

- [8] Vassiou K, **Tsougos I**, Kousi E, Vlychou M, Athanasiou E, Theodorou K, Arvanitis DL, Fezoulidis IV Application value of 3T 1H-magnetic resonance spectroscopy in diagnosing breast tumors. 2013 Acta Radiol, 54(4):380-388.
- [9] Svolos P., Tsolaki E., Theodorou K., Fountas K., Kapsalaki E., Fezoulidis I., **Tsougos I**. Classification Methods for the differentiation of atypical meningiomas using Diffusion and Perfusion techniques at 3T MRI. Clinical Imaging, 2013 Sep-Oct;37(5):856-64.
- [10] Svolos P., Tsolaki E., Theodorou K., Fountas K., Kapsalaki E., Fezoulidis I., Kappas C, **Tsougos I**. "Investigating brain tumor differentiation with diffusion and perfusion metrics at 3T MRI using pattern recognition techniques". Magn Reson Imaging. 2013 Nov;31(9):1567-77.
- [11] **Tsougos I**, Svolos P, Kousi E, Athanassiou E, Theodorou K, Arvanitis D, Fezoulidis I, Kappas C, Vassiou K. The contribution of Diffusion Tensor Imaging and Magnetic Resonance Spectroscopy, for the differentiation of breast lesions at 3T. Acta Radiol. 2014 Feb;55(1):14-23.
- [12] Lavdas E., **Tsougos I**, Kogia S., Gratsias G., Svolos P., Roka V., Fezoulidis I, Kapsalaki E, T2 FLAIR artifacts at 3T Brain Magnetic Resonance Imaging (MRI)" Clin Imaging. (2014), 38(2): 85-90.
- [13] Lavdas E, **Tsougos I**, Arikidis N, Roka V, Fezoulidis IV, Vlychou M. Evaluation of fat saturation and contrast enhancement on T1-weighted FLAIR sequence of the spine at 3.0 T. Clin Imaging. (2014), 38(4): 428-433.
- [14] Tsolaki E, Kousi E, Svolos P, Kapsalaki E, Theodorou K, Kappas C, **Tsougos I**. Clinical decision support systems for brain tumor characterization using advanced magnetic resonance imaging techniques. World J Radiol 2014; 6(4): 72-81
- [15] Svolos P, Kousi E, Kapsalaki E, Theodorou K, Fezoulidis I, Kappas C, **Tsougos I** "The role of Diffusion and Perfusion Weighted Imaging in the differential diagnosis of cerebral tumors: A review and future perspectives". Cancer Imaging 2014, 29 April 14(1):20.
- [16] Tsolaki E, Svolos P, Kousi E, Kapsalaki E, I. Fezoulidis, K Fountas, Theodorou K, Kappas C, **Tsougos I** Fast Spectroscopic Multiple Analysis (FASMA) for brain tumor classification - A Clinical Decision Support System utilizing multiparametric 3T MR data Int J Comput Assist Radiol Surg. 2015 Jul 3, 10(7): 1149-1166.
- [17] A Vamvakas , **I Tsougos**, N Arikidis, E Kapsalaki, I Fezoulidis, L Costaridou Local Curvature Analysis for Differentiating Glioblastoma Multiforme from Solitary Metastasis Alexandros Imaging Systems and Techniques (IST), 2016 IEEE 177-182 978-1-5090-1817-8/16
- [18] Neuroimaging methods in Epilepsy of Temporal Origin **Ioannis Tsougos***, Evanthia Kousi, Panagiotis Georgoulis, Eftychia Kapsalaki, Kostas N. Fountas. Current Medical Imaging Volume 15 , Issue 1 , 2019 DOI : 10.2174/1573405613666170622114920
- [19] Fanariotis M, Vassiou K, **Tsougos I**, Fezoulidis I. Reproducibility of apparent diffusion coefficient measurements evaluated with different workstations. Clin Radiol. 2018 Feb;73(2):141-148. Epub 2017 Dec 18.
- [20] A Vamvakas , **I Tsougos**, N Arikidis, E Kapsalaki, I Fezoulidis, K. Fountas, L Costaridou Exploiting Morphology and Texture of 3D Tumor Models in DTI for Differentiating Glioblastoma Multiforme from Solitary Metastasis Biomedical Signal Processing and Control 43 (2018) 159–173
- [21] Fanariotis M, Vassiou K, **Tsougos I**, Fezoulidis I. Pre and post contrast Diffusion Weighted Imaging of the breast at 3 Tesla Clinical Radiology CRAD-D-18-00308, 2018
- [22] Fanariotis M, **Tsougos I**, Vlychou M, Fezoulidis I, Vassiou K. Contrast-enhanced and unenhanced diffusion-weighted imaging of the breast at 3 T. Clin Radiol. 2018 Jul 27. 2018.06.019. [Epub ahead of print]

- [23] **Tsougos I**, Vamvakas A, C. Kappas, Fezoulidis I, Vasiou K. "Application of Radiomics and Decision Support Systems for Breast MR differential diagnosis." *Computational and Mathematical Methods in Medicine* Volume 2018, Article ID 7417126.
- [24] **I. Tsougos**, M. Bakosis, D. Tsivaka, Athanassiou E, Theodorou K, Arvanitis D, Fezoulidis I, Kappas C, Vassiou K. "Diagnostic performance of quantitative Diffusion Tensor Imaging for the differentiation of breast lesions at 3T." *Clin Imaging*. 2019 Jan - Feb;53:25-31.2018
- [25] "Imaging Biomarker Analysis of Advanced Multiparametric MRI for Glioma Grading" A. Vamvakas, S. Williams, K. Theodorou, E. Kapsalaki, K. Fountas, C. Kappas, K. Vassiou., **I.Tsougos**. *European Journal of Medical Physics* (2019) 60 188-198.